Description

Method for negotiating bearer properties in IP networks

Newer communication architectures, which use packet-based or
cell-based methods for voice signal transmission, such as
5   Voice-over-IP (VoIP) or Voice-over-ATM (VoATM) for example,
make provision for the separation of call control and user
channel control. The communication between one or more
subscribers such as ISDN subscribers, previously routed via
conventional circuit-switched telecommunications networks for
10 example, is then routed via IP networks. Conventional analog
or ISDN terminals can continue to be used as terminals. The
basic circumstances for ISDN subscribers between whom an
Internet IP is arranged, can be taken from Fig. 1.

Basically the call processing networks are subdivided into
15 units used for the transport of bearer information and units
used for bearer control. To continue to make it possible to
communicate using conventional circuit-switched
telecommunication networks, e.g. PSTNs (Public Switched
Telephone Networks), a "translation" between these two
20 different transport technologies is required, which is
undertaken in the coupling points.

At such a coupling point the first transport technology for
the bearer information is converted into the second transport
technology by means of specific devices known as Media
25 Gateways (MG). Media Gateways possess both interfaces to PSTN/
ISDN and also IP/ATM networks and thus form the interfaces
between circuit-switched and packet-oriented networks. They
can convert TDM (Time Division Multiplexing)-based voice
transmission into packet (VoIP)-/cell (VoATM)-based voice

transmission and vice-versa.

The Media Gateways are controlled by central entities, the
Media Gateway Controllers (MGC) (Fig. 1). The signaling
information transmitted between two Media Gateway Controllers
5   is transported for example by means of a BICC (Bearer
Independent Call Control) protocol. The Media Gateway
Controllers are used essentially for coordination of the Media
Gateways and monitor/control (bearer) connections between the
Media Gateways. The Media Gateways are controlled with the aid
10   of the MGCP (Media Gateway Controller Protocol) or also the
H.248 protocol.

Basically the transmission properties are defined in the Media
Gateways. If for example the subscriber of an A-law country
wishes to set up a connection to a subscriber located in a
15   μ-law country these properties come into play. If the user
information of the two subscribers is encoded in accordance
with different laws, the user information must be converted.
This problem arises for example with international telephone
and data traffic from Europe (A-Law) to the USA (μ-law).

20   Before the conversion process the Media Gateways included in
the information flow must negotiate with each other per
connection setup jointly-supported "codecs and capabilities"
(bearer properties) and agree on specific settings. To this
end each Media Gateway maintains a list of bearer properties
25   which it supports and which are already predetermined ex-
works.

The problem with this is that only the two Media Gateways thus
have knowledge of the negotiated properties. Under some
circumstances however the network operator would now like, for
30   network policy reasons (e.g. for economic reasons) to

negotiate specific bearer properties (e.g. codecs) with a priority other than that negotiated by the Media Gateways, or be able to exclude specific bearer properties (e.g. codecs, RFC2833, T38) altogether. This is not possible with this prior
5   art.

The object of the invention is to demonstrate a way in which the negotiation of the bearer properties can be designed in such a manner that the rules for it can be modified at any time.

10   The object of the invention is achieved, using the features specified in the preamble of claim 1 as its starting point, by the characterizing features.

The advantage of the invention is its provision and maintenance of an additional reference list in the Media
15   Gateway Controller. This provides the "network policy" in the Media Gateway Controller at a central point in the network. The Media Gateway Controller is thus given a master function in the network, i.e. its reference list is solely responsible for the group of Media Gateways controlled by the Media
20   Gateway Controller independently of the status of the lists kept here. This allows the network operator to administer the bearer properties regardless of the size of his network (number of all Media Gateways/IP clients).

The simple modification of the network policy is achieved by
25   undesired (i.e. unknown or blocked) bearer properties being filtered out by a comparison with the reference list in the Media Gateway Controller. The Media Gateway Controller of the A-side then re-assigns the priorities for the bearer properties remaining after the filtering on the basis of its
30   own reference list. This additional reference list in the

Media Gateway Controller thus inserts a filter in the negotiation of the bearer properties between the Media Gateways and the partner Media Gateway Controller.

The invention is not restricted solely to Media Gateways/Media
5   Gateway Controllers. It can also be applied in a similar manner to IP clients. Likewise the invention can also be applied to other networks or transport technologies such as ATM or MPLS for example, IP networks are not absolutely mandatory, although the invention is described with reference
10   to IP networks.

Advantageous developments of the invention are specified in the subclaims.

The invention is explained in greater detail below with reference to exemplary embodiments shown in the form of
15   Figures.

The figures show:

Fig. 1   a network configuration with PSTN/ISDN terminals, Media Gateways and Media Gateway Controllers,

Fig. 2   the method in accordance with the invention

20   In accordance with the invention each Media Gateway Controller is allocated a reference list. This contains the bearer properties which the network operator concerned supports in their network. This can for example be a predetermined number of codecs or a prioritization of the codecs. The reference
25   list of the bearer properties and the priority of the relevant bearer properties should be able to be administered. In this way the network operator can configure the bearer properties

in the few Media Gateway Controllers as required.

In the present exemplary embodiment it is assumed, as shown in
Fig. 2, that a subscriber of the A-side wishes to establish a
connection to a subscriber of the B-side. The Media Gateway
5   Controller MGC-A of the A-side is informed about this during
the connection setup. Subsequently its reference list is
compared with the list of the Media Gateway MG-A of the A-side
(steps 1, 2) and the intersection between the two lists is
formed. For example all bearer properties can be removed which
10   are not in the own reference list or which are blocked in the
own reference list. The result is notified by the Media
Gateway Controller MGC-A to the Media Gateway Controller MGC-B
of the B-side (step 3).

If the result (e.g. the new codec selected) is not supported
15   by the Media Gateway Controller MGC-B of the B-side, the A-
side is notified via a corresponding acknowledgement message
of a rejection. Else this result is offered to the Media
Gateway MG-B of the B-side (step 4). The bearer properties not
supported here are removed from the offer and the result is
20   incorporated into a list. This list is then made available via
the Media Gateway Controller MGC-B of the B-side (step 5) and
the Media Gateway Controller MGC-A of the A-side (step 6) to
the Media Gateway MG-A of the A-side (step 7).

The negotiation is part of the connection setup. The user
25   information can now be transmitted between the Media Gateway
MG-A of the A-side and the Media Gateway MG-B of the B-side in
accordance with the bearer properties negotiated.